

Proposed Update of Cyanide Water Quality Criteria

Jim Pletl

VAMWA

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Presentation Outline

- Current criteria and issues
- WERF research
- Proposed criteria
- Discussion, Q&A

Current CN Criteria

- Current criteria database assembled in 1984
- Freshwater
 - Acute: 22 ug/l; 15 GMAVs
 - Chronic: 5.2 ug/l; 4 ChVs used; ACR = 8.568
- Saltwater
 - Acute: 1.0 ug/l; 8 GMAVs
 - Chronic: 1.0 ug/l; ACR not used

Freshwater CN WQC Issues

- 15 GMAVs
- FAV = 62.68 ug/l
- FAV lowered to 44.73 ug/l to protect rainbow trout
- A warm water criterion could be different

Saltwater CN WQC Issues

- Very small data set
- Guidelines require min of 8 taxonomic groups for FAV
- Data for only 8 taxonomic groups available
- Results in extrapolation of FAV below lowest GMAV

Saltwater CN WQC Issues

- Distribution of 4 lowest GMAVs is very wide
 - M. bahia 118.4 ug/l
 - M. menidia 59 ug/l
 - A. clausii 30 ug/l
 - C. irroratus 4.893 ug/l
- Three of four most sensitive species are within 4x of each other in sensitivity, Cancer is 6-22x more sensitive than these species
- If C. irroratus GMAV was actually 15 ug/l, the FAV would be 7.1 ug/l rather than 2.0 ug/l

Saltwater CN WQC Issues

- Lowest GMAV based on two tests for *C. irroratus*, one lab, 1981
- Tests not well documented
- *C. irroratus* test results may not represent genus sensitivity

WERF

- Water Environment Research Foundation
- Formed in 1989, nonprofit
- 300 Research Reports in 20 years, \$62 million
- Funded by subscribers and federal government

WERF Research

- Updated national WQC database in 2007
- Literature search and additional tests
- Recalculated acute and chronic WQC

WERF Research

- Project SubCommittee
 - Walter Berry, EPA
 - Mary Reiley, EPA
 - Phil Dorn, Shell
 - Joe Gorsuch, GEMS
 - Jim Pletl, HRSD
- Project Team
 - Parametrix, Inc.
 - Carnegie Mellon University
 - Hydroqual, Inc.

WERF Research

- New data found or generated
- Freshwater:
 - 13 new GMAVs found in literature
 - Data for larval amphibians added
- Saltwater:
 - 1 new GMAV found in literature
 - New data for *C. irroratus* and other Cancer species located or generated
 - Cancer GMAV changed from 4.893 ug/l to 84.69 ug/l, 1981 data not discarded, Cancer irroratus SMAV changed to 22.11 ug/l

Test, SMAV and GMAV Stats

(ranked GMAVs in ug/L)

	1984 FW	2007 FW	1984 SW	2007 SW
#1 sensitive GMAV	Rainbow trout 63.45	Rainbow trout 46.53	Rock crab 4.893	Acartia 17.00
#2 GMAV	Brook trout 85.80	Brook trout 85.80	Acartia 30	Silverside 59.00
#3 GMAV	Yellow perch 92.64	Atlantic salmon 90.00	Silverside 59	Cancer sp. 84.69
#4 GMAV	Bluegill 99.28	Yellow perch 92.64	Mysid shrimp 118.4	Mysid shrimp 118.4
# GMAVs	15	28	8	9
# SMAVs	17	31	9	14

Proposed Freshwater Criteria (ug/l)

	1984 Criteria	Recalc: All Species	Recalc except for Salmonids
CMC	22	23	47
ACR	8.568(ChV)	9.659(EC20)	9.659(EC20)
CCC	5.2	4.8	9.8

Proposed Saltwater Criteria (ug/l)

	1984	Recalculated
CMC	1.0	5.5
ACR	2 (BPJ)	9.659 (EC20)
CCC	1.0	1.1

Questions?

T&E Species Protection

- Weight of evidence across two approaches
 - Compare sensitivity of T&E species to rainbow trout using data and ICE model
 - Compare species sensitivity distribution for T&E surrogates (intra-genus, intra-family) to draft revised criteria
- T&E species are not more sensitive than rainbow trout and species sensitivity distribution shows all values greater than the CMC
- Proposed criteria are protective of T&E species